

ABSTRACT

An object is to provide a high-frequency plasma generating apparatus and process which can further advance 5 uniformity of the thickness of a film on a substrate with a large area in comparison with conventional apparatuses. In a reaction chamber (1), a ground electrode (3) is disposed, and a discharge electrode (2) is disposed opposite to the ground electrode (3). A substrate (4) as a processing object is 10 placed in close contact with the ground electrode (3). A high-frequency voltage is applied to the discharge electrode (2) so as to generate plasma between the ground electrode and the discharge electrode. An RF electric power supply (15) generates a first high-frequency voltage, and outputs the 15 generated voltage on feeding points (9) disposed on a lateral portion of the discharge electrode (2). An RF electric power supply (16) generates a second high-frequency voltage, and outputs the generated voltage on feeding points (9) disposed on another lateral portion of the discharge electrode (2). 20 Here, the second high-frequency voltage has the same frequency as that of the first high-frequency voltage and has a phase which varies with a low-frequency signal, which is modulated by a predetermined modulation signal.